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ABSTRACT

The effects of part-time work of high school students on school-related behaviors and on career expectations were studied. Five dependent variables were classified as school-related behaviors: days tardy, days absent, number of extracurricular activities, transcript grade averages, and self-reported grades. Four career expectation variables were included: youth's educational expectations, youth's occupational expectations, parental educational expectations for youth, and parental occupational expectations for youth. Three waves of data were collected from 714 youths attending public high schools in Columbus, Ohio; 597 youths and their parents completed all three waves in grades 10, 11, and 12. Little support was shown for the general hypothesis that working interferes with schooling. Data indicated that neither a linear nor a nonlinear effect of hours of work occurs for any of the school-related variables. Investigation of interaction effects revealed scant evidence that the quality of work, as indicated by job status, and hours at work interact to produce effects on school behavior. It was also found that working does not affect career expectations of youth or career expectations that parents hold for their children. (YLB)

EFFECTS OF WORK TIME ON SCHOOL ACTIVITIES AND CAREER EXPECTATIONS

Technical Report

Studies in Employment and Training Policy: No. 4

by

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1982

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FOREWORD

The importance of formal education to success in the work world is well known. Part-time work among high school students is an increasingly demanding part of their lives. Consequently, it is important to understand the possible effects of part-time work of high school students on their commitment to school. The National Center for Research in Vocational Education, therefore, is pleased to present this study of the impact of part-time work on school behaviors and career expectations of teenage youth.

Recognition is due to the author of this report, Lawrence Hotchkiss. Special thanks are due to Richard Zeller, Jeylan Mortimer, Paul Campbell, and Ida Halasz for their scholarly reviews of this report, and to Warren Simmons of the National Institute of Education for his continued support. The diligent work of Jacque Masters in typing the many revisions of manuscript is much appreciated. The quality of the final product has benefited from Janet Kiplinger's careful editing.

Robert E. Taylor
Executive Director
The National Center for Research
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EXECUTIVE SUMMARY

This report examines effects of working part time while attending high school on five school related outcomes, on career expectations that youth hold for themselves, and on career expectations that parents hold for their children. A longitudinal data set is used which contains parents' reports of the expectations they hold for their teenage children. The analysis strategy depends implicitly on a model of change that leads to the inclusion of lagged values of the dependent variable in all equations. Junior year outcomes are studied as a function of sophomore year values on the same outcome, work time, and a set of background and ability control variables.

The empirical results show little support for the general hypothesis that working interferes with schooling. Hours worked have no effect on days absent from school, days tardy from school, number of extracurricular activities, transcript grade point average, or self-reported grades. The hypothesis that time spent at work interferes with schooling is strong enough that several specifications of the effects are tried. A linear specification is evaluated first. A nonlinear specification also is evaluated to check the hypothesis that the effects of time spent at work on schooling increase rapidly after one works in excess of about fifteen hours per week. Also, an interaction specification is checked to see if the effects of working depend on the "quality" of the job as indicated by job status. Finally, the effects of working are evaluated with career expectations included as independent variables. In all of these tests there is little or no evidence that work time affects the five school outcome variables. Additionally, it is found that working does not affect career expectations of youth or career expectations that parents hold for their children.

The analyses conducted for this report do not reveal any reasons to question policy recommendations that youth be encouraged to work part time while in secondary school. The limited number of outcome variables studied in this report and the findings of other research studies, however, indicate that such policies deserve careful evaluation before they are endorsed without reservation.

INTRODUCTION

The incidence of part-time employment while attending high school has increased dramatically over the past decades. Greenberger and Steinberg (1981) report that the percentage of males in the age range of fourteen to sixteen who have ever worked has increased fivefold since 1940. For females, the analogous statistic has increased by a factor of eleven. Further, in excess of 80 percent of today's teenagers have worked for some period of time while still enrolled in high school. The benefits of working while attending secondary school have been espoused in policy papers by the Carnegie Commission on Policy Studies in Higher Education (1980), National Commission on Youth (1980), National Panel on High School and Adolescent Education (1976), and President's Science Advisory Committee (1973). The studies on which these papers were based have recommended policies to encourage part-time work during high school on the assumption that work contributes to development of attitudes and knowledge that are important to success in the adult labor market. Particular emphasis has been placed on development of responsible attitudes toward punctuality and willingness to perform tasks on the job as directed by supervisors.

Additionally, research is beginning to accumulate showing that working while in secondary school contributes to success in the job market after leaving school. Higher wage rates and smaller chances of unemployment are associated with part-time work during secondary schooling (Stephenson 1981, Meyer and Wise 1980). Ellwood (1981) examined the causal structure of the association between work while in high school and later success in the labor market. He found that, while part of the bivariate association reflects unmeasured abilities and tastes that tend to cause youth to work more both during and after school, there is an important causal element to the association between in-school and postschool work.

Greenberger and her associates, on the other hand, have carried out extensive examination of the consequences of working part-time while in secondary school on nonwork outcomes while still in school. They conclude that work while in school is, at best, a "mixed blessing." As assumed in the policy papers cited previously, work does appear to increase the personal responsibility of young workers and improves practical knowledge of the work world. There are dysfunctional side effects of work, however. Youth who work are more likely to develop a cynical attitude toward work, are less involved in school, are more apt to smoke tobacco and marijuana, spend less time with their families, and are more frequently absent from school. Further, working youth are no less likely to commit deviant acts than nonworking youth (Greenberger and Steinberg 1981). Additionally, there is mixed evidence that working more than fifteen hours per week leads to a decline in school grades. Cross-sectional data show this outcome (Steinberg, Greenberger, Garduque, and McAuliffe 1982), but longitudinal data fail to confirm it (Steinberg, Greenberger, Garduque, Ruggiero, and Vaux 1982).

It is difficult to evaluate the overall desirability of part-time work during secondary schooling. On the one hand, some studies show a small positive impact on postschool labor market outcomes. On the other hand,

Greenberger and her associates conclude that the issue is by no means clear cut, and much evidence should be accumulated before a clear endorsement of policy to stimulate part-time work of high school students is merited. Certainly, the caution expressed by Greenberger and her collaborators appears justified. The studies finding positive impact of in-school work on post-school labor market experiences are by no means definitive, and the analyses are confined to samples in which postschool measures occurred within a few years of leaving school. It is well documented that education effects on labor market experiences persist over a substantial segment of one's working life (Blau and Duncan 1967; Sewell and Hauser 1975; Alexander, Eckland, and Griffin 1975). Hence, if part-time work during school adversely affects educational experiences, then enthusiastic support of policy to foster work while still in school is premature.

The goal of the present paper is to add to the information that Greenberger and her associates have been accumulating about effects of in-school work on school-related behaviors and on career expectations. The data set to be used in the analysis was collected in connection with a three-wave longitudinal study of significant other influences on developing career expectations. The study was conducted in Columbus, Ohio. For convenience, these data hereafter will be referenced as the Columbus Longitudinal Data, or CLD for short. While the CLD do not contain the rich detail on work experience and broad coverage of attitudes and behaviors that form part of the Greenberger data, they do exhibit useful features that permit some extensions and refinements of the Greenberger results. First, the sample is balanced by race, thus permitting estimates of race effects that are not feasible with the Greenberger data. Second, the data are longitudinal; hence, study of change over time is encouraged. Finally, complete work histories are available for respondents' last three years of high school.

HYPOTHESES

Greenberger and her associates classify the potential outcomes of combining schooling and work into three categories: (1) attitudes related to personal and social responsibility; (2) involvement in nonwork spheres of activity, including family, school, and peer relationships; and (3) antisocial behavior and attitudes (e.g., unethical behavior on the job, consumption of marijuana, tobacco, and alcohol). Due to limitations of the variables contained in the CLD, the present study is confined to outcome measures that most closely fit into the second category, with a focus on school-related behavior and career expectations.

The hypothesis that working contributes to the cognitive development of youth is not born out by empirical evidence. Detailed observational data on activities while working show very little opportunity for learning (Greenberger, Steinberg, and Ruggiero 1982). Students who work spend less time on homework, participate in fewer extracurricular activities, and express more distaste for school than those who do not work (Steinberg, Greenberger, Garduque, and McAuliffe 1982). Absence from school is more frequent among workers than among nonworkers. Work in excess of fifteen hours per week

may adversely affect academic performance, although evidence on this point is mixed (Steinberg, Greenberger, Garduque, Ruggiero, and Vaux 1982).

Although Greenberger and associates do not emphasize the relationship between career expectations (e.g., education and occupation) and work, the CLD contain such a rich assortment of career expectation variables that it is natural to investigate their relationships to work variables. The strong impact of high school expectations on career achievements is well documented (Sewell and Hauser 1975; Otto and Haller 1979; Alexander, Eckland, and Griffin 1975). Consequently, if working during high school affects those expectations, career achievements ultimately may be affected as well.

The complexity of possible relationships between working and career achievements is difficult to predict in advance. However, one potential line of influence from work to aspirations may approximate the following chain where the signs associated with the arrows indicate a direct (+) or inverse (-) effect.

$$\text{work} \xrightarrow{-} \text{academic performance} \xrightarrow{+} \text{expectations}$$

Since work time is time that cannot be spent on schooling, it may generate a decline in academic performance, which in turn may tend to lower expectations.

DATA AND METHODS

The data used in this paper were collected in connection with a study of significant other influence on changes in career expectations. Three waves of data were collected from a sample of 714 youth attending public high schools in Columbus, Ohio. The sample is balanced by race and sex. The first wave of data was collected during the sophomore year of these youth. Subsequent waves were collected during the fall of respondents' junior and senior years in high school. Self-administered questionnaires were hand carried to respondents' homes by persons with professional training and experience in conducting interviews in survey research. These "interviewers" remained in the homes to supervise completion of the questionnaires and carried the completed questionnaires back to the administrative headquarters. Questionnaires were included for the youth and each parent. In all cases, at least one parent completed a questionnaire. Over 90 percent of the mothers did so, and a little over half of the fathers did. The overall attrition rate of youth from wave one to wave two was 12 percent; from wave two to wave three it was 5 percent, leaving a sample of 597 youth who completed all three waves (for details, see Hotchkiss and Chiteji 1981).

In addition to the questionnaire data, three other types of information form part of the data set: (1) mental ability test scores, (2) school transcripts, and (3) school assignment data. The mental ability tests were administered in the high schools, with an approximately 87 percent completion rate. School transcripts were obtained from the public school system for about 70

percent of the sample.[1] The school assignment data were taken from the official school records to identify students who were assigned to schools outside their home school attendance area in order to achieve racial integration of the schools. School assignment data are present for about 94 percent of the 597 members of the sample who completed all three waves.

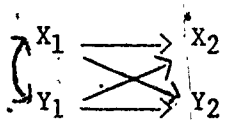
Information about the work experience of the youth in the sample was collected as part of the wave-three questionnaires. Respondents were asked to provide the following information for each job they had held: (1) the name and duties of the job, (2) the name of the place of business, (3) the starting date (to the nearest month), (4) the ending date (to the nearest month), (5) the approximate number of hours per week, (6) the hourly wage, and (7) whether the employer was a relative of the youth. These data were arranged into records describing the job experience of each respondent for each month, beginning with the earliest date of a job reported by any respondent and ending with the last month of the wave-three survey. Thus, for example, to estimate the total earnings of a respondent during the 1978-1979 school year, one sums the products of wages and hours for each job held during each month during the school year and multiplies the result by 52/12 to account for the fact that hours are given for weeks rather than months. Similarly, an estimate of the number of weeks worked during the school year can be formed by counting the number of months in the school year during which at least one job was held and multiplying the result by the ratio 52/12.

The time points for the questionnaire data do not coincide with the time points for the school assignment data and the grade point average, school attendance, and school tardiness data obtained from transcripts, however. Hence, some adjustment of the questionnaire data was necessary. Wave-one questionnaire data were collected past the midway point of the sophomore year. In contrast, the wave-two and wave-three questionnaire data were collected at the beginning of the respective school years. To estimate the career expectation variables at the end of the junior year, averages of wave-two and wave-three variables were calculated. The analysis is carried out as if two complete waves of data were available, wave one describing the end of the sophomore school year, and wave two describing the end of the junior year.

Parameter estimation is carried out by applying ordinary least squares (OLS) regression to the constructed two waves of data. Correlation matrices calculated from the data present for each pair of variables were entered into the regression calculations. Time-two variables are the dependent measures, and regressors are selected from the time-one data. The lagged measure of the dependent variable is always included in the set of regressors to reduce estimation bias due to probable feedback effects among the key variables. For example, it is hypothesized that hours of work during the school year negatively affect grades because the hours at work reduce time available for homework. On the other hand, grades probably have a positive effect on employer demand for one's services. Hence, disentangling cause from effect in cross-sectional data would be impossible. Further, due to strong serial

1. Efforts to increase this percentage continue.

correlation of most variables, failure to control for lagged values of each dependent variable is likely to generate serious bias in the effect estimates. In a system such as the following,



the coefficient of Y_2 on X_1 in the absence of control for Y_1 would inflate the estimate of effect of X on Y (assuming X and Y are positively correlated in the cross sections).

In estimating the cross-lagged model it is not necessary to view the lag time between cause and effect as iden ical to the length of time between measurements. With the school and work variables, it is likely that the length of time between cause and effect is much shorter than the year between measurements. Consider the following simultaneous model:

$$Y_t = BY_0$$

where Y_t is the vector of observations on the Y variables at time t and B is a square matrix of constant effects. With this simple model,

$$Y_2 = B^2Y_0$$

as in a Markov chain with constant transitions (see Coleman 1968, Doreian and Hummon 1976; Hotchkiss 1979). If one were to estimate the regression of Y_2 on Y_0 as

$$Y_2 = B^*Y_0$$

the result would be an estimate of B^2. Thus, the regressions can be interpreted as indicators of effects, but not as estimates of the "fundamental" parameters of the model.[2] In the present paper, complete simultaneous systems are not specified, so estimates of the fundamental parameters cannot be obtained. Consequently, the work reported here must be viewed as exploratory.

Variables

Operational definitions of all variables used in the study are shown in table 1. The table also displays the mean, standard deviation, and number of cases present for each variable. The number of cases present for the status variables in each year indicates approximately the number of youth employed at least part of the time during each of the two school years--216 (36 percent) for sophomores and 331 (55 percent) for juniors.

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2. In fact, it cannot be absolutely guaranteed that the signs of the regression coefficients will match the signs of the entries in B, though the signs generally will match (Hotchkiss and Chiteji 1981).

TABLE 1

DEFINITION OF VARIABLES AND DESCRIPTIVE STATISTICS

Mean	Std. D.	N.		Variables
1.081	1.301	597	1.	Parental socioeconomic status--mean of father's and mother's education and occupational status, after standardizing to a common mean and variance. Primary data sources were parents' reports; youth's reports were substituted if the parents' were missing.
19.8	11.0	592	2.	Family income (in thousands of dollars)--average of mother's and father's reports of family income. The youth's report was substituted if both parents' reports were missing.
1.41	1.33	597	3.	Number of brothers--as reported by the mother.
1.44	1.41	597	4.	Number of sisters--as reported by the mother.
.923	.267	597	5.	Mother in household (1=yes, 0=no)--as reported by the mother if present, or by the father otherwise.
.504	.500	597	6.	Father in household (1=yes, 0=no)--as reported by the mother if present, or by the father otherwise.
.516	.500	597	7.	Gender of the youth (1=female, 0=male)--as reported by the youth.
.479	.500	597	8.	Race of the youth (1=black, 0=white)--as reported by the youth.
44.7	15.0	517	9.	Mental test score--sum of verbal and quantitative subtests on the Thurstone Test of Mental Alertness. The test was administered in the schools especially for the study.
187.	415.	597	10.	Work hours for sophomore school year--estimated from the job history data by summing the hours on each job for each month during the school year. Those who did not work were assigned zero hours.
361.	526.	597	11.	Work hours for junior school year--estimated from the job history data by summing the hours worked on each job for each month during the school year. Those who did not work were assigned zero hours.

TABLE 1 (continued)

Mean	Std. D.	N.		Variables
23.0	15.1	216	12.	Job status for sophomore year--estimated by converting three-digit 1970 census codes to Duncan SEI scores (Hauser and Featherman 1977, app. B). The status score for the school year was calculated as a weighted average of the status of all jobs held during the year, using hours as the weight. Youth with no jobs were assigned the missing data code (see text, however).
23.9	14.2	331	13.	Youth's job status for junior year--estimated by converting three-digit 1970 census codes to Duncan SEI scores. The status score for the school year was calculated as a weighted average of the status of all jobs held during the year, using hours as the weight. Youth with no jobs were assigned the missing data code (see text, however).
15.1	16.9	388	14.	Days absent from school, sophomore year--taken from school transcripts.
18.7	24.6	399	15.	Days absent from school, junior year--taken from school transcripts.
15.3	20.0	335	16.	Days tardy to school, sophomore year--taken from school transcripts
12.0	12.6	319	17.	Days tardy to school, junior year--taken from school transcripts.
1.97	1.76	594	18.	Number of extracurricular activities, sophomore year--counted from a checklist completed by students as part of the survey.
1.64	1.54	597	19.	Number of extracurricular activities, junior year--counted from a checklist completed by students as part of the survey.
2.07	.999	406	20.	Transcript grades, sophomore year--grade point average for the sophomore year, taken from student's transcript.
2.15	1.02	416	21.	Transcript grades, junior year--grade point average for junior year, taken from student's transcript.
2.41	.821	594	22.	Self-reported grades, sophomore year--student's view of how good a learner s/he is. Response options are letter grades, and the scale is 0-4.

TABLE 1 (continued)

Mean	Std. D.	N.		Variables
2.51	.733	592	23.	Self-reported grades, junior year--average of student's view of how good a learner s/he is as reported on wave-two and wave-three questionnaires. Response options are letter grades, and the scale is 0-4.
.394	.489	564	24.	School reassignment for desegregation--determined from school documents by comparing the student's actual school assignment to the school in the home district. If the two schools were the same, a code of zero was assigned. If they were different, a code of one was assigned.
14.5	1.93	597	25.	Youth's educational expectation in years of schooling, sophomore year--average of two items on the survey. One item is based on subjective probabilities, and the other is a conventional checklist item.
14.6	1.86	597	26.	Youth's educational expectation in years of schooling, junior year--average of two items on the survey. One item is based on subjective probabilities and the other is a conventional checklist item. The value for the entire junior year was estimated by averaging comparable survey variables from the first of the junior year and the first of the senior year.
47.8	9.86	597	27.	Youth's occupational expectation, sophomore year--average of two variables. One variable is based on subjective probabilities, and the other is the total score from the Occupational Aspiration Scale (Haller and Miller 1971).
47.1	8.83	597	28.	Youth's occupational expectation, junior year--average of two variables. One variable is based on subjective probabilities, and the other is the total score from the Occupational Aspiration Scale. The value for the entire junior year was estimated by averaging comparable variables from the first of the junior and senior years.
14.4	1.76	597	29.	Parents' educational expectation for the youth in years of schooling, sophomore year--average of two items on the survey. One item is based on subjective probabilities, and the other is a conventional checklist item. Mother's and father's scores were averaged to get parent's score.

TABLE 1 (continued)

Mean	Std. D.	N.		Variables
14.4	1.73.	595	30.	Parents' educational expectation for the youth in years of schooling, junior year--average of two items on the survey. One item is based on subjective probabilities, and the other is a conventional checklist item. The value for the entire junior year was estimated by averaging comparable survey variables from the first of the junior year and the first of the senior year. Mother's and father's scores were averaged to get parent's score.
49.9	8.83	597	31.	Parents' occupational expectation for the youth, sophomore year--average of two variables. One variable is based on subjective probabilities, and the other is the total score from the Occupational Aspiration Scale (Haller and Miller 1971). Mother's and father's scores were averaged to get parent's score.
49.0	8.30	595	32.	Parent's occupational expectation for the youth, junior year--average of two variables. One variable is based on subjective probabilities, and the other is the total score from the Occupational Aspiration Scale. The value for the entire junior year was estimated by averaging comparable variables from the first of the junior and senior years. Mother's and father's scores were averaged to get parent's score.

FINDINGS

Effects of Work on School Outcomes

The hypotheses of primary interest in this paper center on the effects on school activities of time spent at work. The CLD contain five variables delineating school behavior of youth that have been found in past studies to be adversely affected by work: days absent from school, days tardy to school, participation in extracurricular activities, and two measures of grade point average. The first measure of grades is a yearly average taken from the students' transcripts. The second measure is a self-reported item that reflects self-image of ability as a student. The response alternatives are letter grades, and the item is scaled with a minimum of zero and a maximum of four. The primary advantage of the transcript measure is that it is a relatively objective indicator of performance in school, but there is a substantial percentage missing (about 30 percent). Nearly 100 percent of the data for the self-reported measure are present, and it indicates a somewhat different concept. Correlations between the transcript and self-reported variables are modest--.56 for the sophomore year, .46 for the junior year. Yet, with one important exception, the two measures are nearly interchangeable in the data analyses reported in this paper. The time-two measure of each of these variables is defined as a dependent variable; the time-one measure on each variable--an index of parental socioeconomic status, family income, number of brothers, number of sisters, mother present in the household, father present in the household, gender, race, the ability test score, and school assignment--are entered as "control" variables on the right side of each of the equations. The primary independent variable is hours of work during the first year of the survey.

A linear and nonlinear equation is reported for each dependent variable. The nonlinear version is intended to check the observation reported by Greenberger and her associates that work time does not adversely affect grades until one works more than fifteen hours per week. To test for this possibility in the CLD, both hours and the square of hours are entered as regressors. Including the squared term permits the line of best fit to curve sharply upward at some point determined empirically by the estimation procedures. If the effect of working on school activities increases rapidly after fifteen hours of work per week, then the regression line should bend up at this point. The results of these calculations are displayed in table 2.

The most salient finding in table 2 is that hours of work have no effect on any of the school variables--days absent from school, days tardy to school, number of extracurricular activities, and the two measures of grade point average for the year. Hours at work approaches significance in the days tardy equation, however ($p \leq .1114$; $b > 0$). The nonlinear specification does not alter this conclusion. In fact, adding the square of hours to the equations leaves all the coefficients, except for those on hours, virtually unchanged. Generally, the background variables do not have direct effects on the school variables either. This observation should not be misinterpreted. Absence of a direct effect does not necessarily imply absence of a total effect; the

TABLE 2

EFFECTS OF HOURS AT WORK ON SCHOOL BEHAVIOR

	Dependent Variables (Junior Year)									
	Linear Specification					Nonlinear Specification				
Independent Variables (Soph Year)	Days Absent	Days Tardy	No. of Ex Cur.	Trans Grades	Self Rep Grades	Days Absent	Days Tardy	No. of Ex Cur	Trans Grades	Self Rep Grades
Intercept	8.28	11.0**	.100	.747***	.941****	8.33	11.0**	.105	.744***	.941****
Parental SES	.598	.798	-.0152	.00540	.0337	.609	.803	-.0141	.00494	.0340
Fam Income	- .148	.0195	.00351	-.000130	-.00362	- .149	.0192	.00343	-.000101	-.00365
N brothers	- .144	- .0806	.0673+	.0290	-.0204	- .120	- .0700	.0699*	.0280	-.0197
N sisters	- .0743	.392	.00937	.0502*	.0344*	- .0526	.402	.0117	.0493*	.0350*
Mother in HH	4.31	- .843	-.143	-.197	-.0874	4.36	- .819	-.137	-.199	-.0857
Father in HH	3.13	1.52	-.248*	-.0783	.00482	3.09	1.50	-.251*	-.0774	.00393
Gender (1=fem)	1.59	-1.06	-.0832	.143*	.133**	1.67	-1.03	.0750	.140*	.135**
Race (1=black)	2.77	2.85+	.269*	-.328****	.0487	2.73	2.83+	.264*	-.362****	.0473
Mntl test sc	- .0306	- .121*	.0107**	.00244	.00835****	- .0307	- .121	.0107**	.00244	.00833****
School assign	-4.38+	-2.35+	-.237*	.0363	.0261	-4.48+	-2.39+	-.247*	.0399	.0235
(Lagged D.V.)	.546****	.287****	.588****	.704****	.493****	.546****	.287****	.588****	.705****	.494****
Hrs at wrk (100s)	.0846	.241	.00369	.00725	.00230	- .146	.136	.0215	.0165	.00456
Hrs (100s) sq	--	--	--	--	--	.0150	.00680	.00163	-.000595	.000431
R-square	.1495****	.2775****	.4896****	.5578****	.4398****	.1499****	.2778****	.4906****	.5581****	.4401****
Adj R-square	.1231	.2492	.4791	.5446	.4282	.1212	.2470	.4792	.5438	.4275

NOTES: Probabilities are for two-tailed tests.

Coefficients are OLS estimates (unstandardized).

"Lagged D.V." is the sophomore year (t_1) value of the dependent variable in each equation.

\+ $p \leq .1$
* $p \leq .05$
** $p \leq .01$
*** $p \leq .001$
**** $p \leq .0001$

lagged dependent variables probably account for these results. An appropriate reduced-form estimation could be expected to reveal long-term total effects of the exogenous variables.[3]

The only statistically significant effect in the equation for days absent is on the lagged value of days absent; however, school assignment has a nearly significant negative effect on days absent. Absence from school evidently is determined primarily by physical health, though social and psychological factors probably exert important secondary influences, so this result is not altogether surprising. According to the regression estimates, blacks are more frequently tardy, and those with high test scores are less frequently tardy. Assignment to a school outside one's home attendance area also tends to reduce tardiness. The mental ability test score is associated with a positive coefficient on extracurricular activities. Father in the household tends to reduce the number of extracurricular activities. This result is difficult to interpret and probably should not be taken seriously unless it is replicated in other data. Gender manifests a significant positive effect on both measures of grades, with females earning higher grades and believing themselves to be better students than males. These findings are consistent with past research. It is interesting that the number of sisters one has tends to exert a positive effect on grades. While this result was not anticipated, it is easy to interpret. Females earn higher grades and evidently influence their siblings, perhaps both by example and direct communication, to do likewise.

The pattern of race and test score effects on the two measures of grades is curious. The test score variable has a strong effect on students' self-image regarding grades, and race does not have a statistically significant impact. This pattern is reversed for transcript grade point average. These results are not produced by perverse bivariate correlations between the test score and the two grade variables. The correlation between test score and transcript grades is virtually identical to the correlation between test score and self-reported grades for both time points (approximately .40). A detailed investigation of the causal structure that generates this pattern is beyond the scope of this study; however, it is noteworthy that since the transcript grades equation contains a measure of mental ability, the strong negative impact of race on transcript grade average is consistent with a discrimination hypothesis. Another possibility is that grading standards homogenized as a result of desegregating the schools. Assuming that predominantly black schools held relatively low grading standards prior to desegregation, exposure of blacks to homogenized standards would tend to lower their grades from their sophomore to junior year. Since lagged grades appear in the grades equation, the model is (algebraically) equivalent to a model of change. It would seem more likely, however, that school-specific grading standards would tend to persist at least for the first few years following desegregation. Coupling

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3. The reduced form was not estimated because a complete dynamic system has not been specified. Estimating a reduced form by OLS regression for a dynamic system that has not reached equilibrium can yield misleading results (Hotchkiss and Chiteji 1981).

the assumption of persistence of grading standards with the fact that school assignment appears in the grades equation suggests that desegregation is not the primary reason for the strong effect of race on transcript grades. Thus, the discrimination hypothesis remains viable. While the discrimination hypothesis may account for the strong effect of race on transcript grades even with a control for mental ability test score, it does not account for the nonsignificant effect of the test score. Apparently, a complex causal system is at work here, especially in view of the fact that the test score variable has a larger bivariate correlation with transcript grade than does race (.38 vs. -.25).

Greenberger and her coworkers observe that there is wide variation in the "quality" of jobs that teenagers take (Greenberger, Steinberg, and Ruggiero 1982). One indicator of job quality is the status of the job. If the quality of work is important, then it is reasonable to expect that the effects of time spent working on school outcomes depend on how "good" the job is. If so, then hours and job status should exhibit statistical interaction in affecting school outcomes. To test this interaction hypothesis, the product of hours and job status was added to the equations for the school outcomes.

There is sufficient confusion in the literature regarding interpretation of interaction terms in regression equations that a brief discussion is warranted of the correspondence between the statistical analysis and the substantive hypotheses at hand. The equation for grades including the interaction effect can, for expository purposes, be simplified to

$$G = a + bH + cS + dH \cdot S$$

where

G = grades
H = hours of work
S = job status
a,b,c,d = constant coefficients.

Differentiating grades with respect to hours of work gives the effect of hours on grades with status constant, as

$$\frac{\partial G}{\partial H} = \text{effect of hours on grades} = b + dS.$$

Thus, the effect of hours on grades is a linear function (b + dS) of the status of the job. This result corresponds precisely to the substantive hypothesis. Interpreting the coefficient d as the "effect" of the product of hours and status, as is frequently done in the empirical literature, is not sensible; one cannot hold both hours and status constant while varying their product. Thus, the effect of their product with everything else remaining constant has no meaning.

A priori, it is reasonable to expect that working long hours at a low-status job would have more deleterious effects on school behavior than

working long hours at a high-status job. Consequently, the coefficient d (on the product term) should be negative for the days absent and days tardy equations and positive in the extracurricular activities and grades equations.

The fact that job status is not defined if one has no job poses difficulties in empirical specification of the interaction equations. Since only about one-third of the sample held jobs during their sophomore year, two-thirds of the job status values are defined as missing. Lacking a clear conceptual resolution of this problem, four strategies were applied: (1) replace missing values for job status with the mean of job status calculated for those who worked during their sophomore year and include a dummy variable for missing values, (2) input to the regression calculations a correlation matrix calculated from data present for each pair of variables, (3) estimate values of job status for those who did not work by applying regression constants derived from the subsample of workers, and (4) substitute zero for job status of those who did not work. The first two options (missing-data dummy and pairwise correlation input) are purely empirical strategies, with little or no conceptual basis. The third strategy (regression estimates) is based on the idea that an estimate of the job status one would have if s/he were working (imputed status) is the appropriate value of status for nonworkers. The final strategy (substitute zero) rests on the idea that status derived from work is the key concept. If one does not work, no status is derived from work. This last strategy is the most pleasing conceptually because it generates a natural value for job status when one does not work, and that value has a clearly defined meaning. Empirically, however, substitution of zero for job status of nonworkers generates a variable with undesirable distribution characteristics. Substitution of regression estimates potentially could generate a distribution of job status without the extreme clustering of values that characterizes use of zeroes. In fact, however, the R-square predicting job status from exogenous variables is so low (about .10) that the regression method does not avoid clustering. Further, the conceptual basis for using the regression estimates is not as clear cut as that for defining nonworkers as having zero status.[4] Why would one expect imputed status to have an effect beyond the effect of the variables used as regressors in generating imputed status? On balance, then, defining nonworkers to have zero status appears to be the preferred method; table 3 reports results based on this method. Calculations were carried out using all four methods, however.

Estimates of interaction effects reported in table 3 fail to support the hypothesis that the effects of hours at work depend on the status of the job. Significant coefficients on the product of hours and status are not present for any of the five equations. Inclusion of job status and the product of hours by status does generate a significant coefficient on the linear term for

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4. Heckman (1976) proposes a slightly modified version using regression estimates. His procedures require estimates of labor force status as well as estimates of job status. The low multiple R-square predicting time-one job status, however, suggests that results of the Heckman procedures would be somewhat difficult to interpret.

TABLE 3

INTERACTION EFFECTS OF HOURS AT WORK AND JOB STATUS ON SCHOOL BEHAVIOR

Independent Variables (Soph Year)	Dependent Variables (Junior Year) Days Absent	Days Tardy	No. of Ex Cur	Trans Grades	Self Rep Grades
Intercept	8.53	10.7**	.109	.747***	.935****
Parental SES	.673	.860	-.0151	.00810	.0339
Fam income	-.154	.0085	.00367	-.000404	-.00377
N brothers	-.0995	-.0621	.0688+	.0315	-.0207
N sisters	-.0298	.429	.0103	.0520*	.0345*
Mother in HH	4.15	-.912	-.145	-.202	-.0869
Father in HH	3.10	1.54	-.250*	-.0802	.00567
Gender (1=fem)	1.93	-.992	-.0715	.157*	.130**
Race (1=black)	2.75	2.99*	.263*	-.329****	.0522
Mntl test sc	-.0263	-.118+	.0107**	.00245	.00840****
School assign	-4.69+	-2.51	-.245*	.0225	.0276
(Lagged D.V.)	.542****	.287****	.591****	.712****	.491****
Hrs at wrk (100s)	.349	.545*	.00694	.0197	.00459
Status of job	-.0691	.0401	-.00372	-.00304	.00192
Hrs (100s) x status	.00678	-.0164	.000122	-.000335	-.000237
R-square	.1516****	.2823****	.4904****	.5602****	.4407****
Adj R-square	.1206	.2493	.4781	.5449	.4271

NOTES: Probabilities are for two-tailed tests.

Coefficients are unstandardized OLS regression coefficients.

"Lagged D.V." is the sophomore year (t_1) value of the dependent variable in each equation.

\+ $p \leq .10$
* $p \leq .05$
** $p \leq .01$
*** $p \leq .001$
**** $p \leq .0001$

hours in the equation for days tardy, however. Recall that this coefficient is nearly significant in the linear specification (table 2). Also, the product term approaches significance in the equation for days tardy ($p \leq .1533$), but the sign is negative rather than positive as originally postulated. On balance, there is very little evidence in these data that work time adversely affects school behavior.

Two of the three other methods for handling missing job status data of nonworkers lead to the same conclusion as that implied by the data in table 3 (additional estimates not tabulated to conserve space). Use of the pairwise missing-data correlation matrix does lead to highly significant interaction effects in the days absent and self-report grades equations, however. But the signs of the coefficients on the product terms in these two equations are just the opposite of the a priori hypotheses, suggesting that adverse effects of work time on school are positively related to job status. In view of the difficulty in defining a conceptual basis for inputting the pairwise missing-data correlations into the regression calculations and the perverse signs associated with the statistically significant interaction effects, results based on the missing-data correlation matrix are not good evidence in favor of the interaction hypotheses.

Although this paper does not report a study of school desegregation, a brief comment on the effects of the school assignment variable is merited. Assignment to a school outside one's area of residence (presumably) to achieve racial integration of the schools tends to improve one's attendance record and punctuality, as indicated by the nearly significant negative effects of school assignment on days tardy and days absent. School assignment outside one's home school area also has a small negative impact on participation in extracurricular activities, reducing the number on the average by just under six-tenths. Grades are not adversely affected by school assignment. School assignment to achieve desegregation of the schools, if carried out smoothly as in the present instance, then does not necessarily have an extreme disruptive impact on the five school outcomes studied here. Of course, a general conclusion regarding effects of school desegregation requires much more extensive analysis than is appropriate in the present paper.

Work and Career Expectations

In this subsection, career expectations are introduced into the analysis, with two objectives in mind. First, in the previous subsection the only variables other than hours included in the equations for the five school behaviors were exogenous or predetermined. Career expectations exert strong effects on career attainments, particularly years of formal schooling completed and occupational status. Consequently, it is reasonable to suppose that career expectations may influence fundamental attitudes toward schooling and school behavior. Examination of the effects of hours at work on school behavior, therefore, is expanded by including career expectations on the right side of the equation for each category of school behavior--days absent, days tardy, number of extracurricular activities, and the two measures of grades.

The primary objective in this expansion of the equations for these school behaviors is to determine whether improved specification will uncover effects of work on these types of school behavior that were not detected up to now. Past experience does not give reason to be optimistic. Adding regressors to an equation generally reduces the effects of variables that were already in the equation. The hypothesis that work time interferes with time allocated to schooling, however, is so strong a priori that it is worthwhile to explore a variety of specifications.

The second objective of this subsection is to examine the effect of work on career expectations. The a priori reasons for hypothesizing that work affects career expectations are not as strong as the reasons for postulating an effect of work on school behavior. Furthermore, failure to detect an effect of work time on grades effectively removes one potential indirect route by which work might affect career expectations. There remain, nevertheless, mechanisms by which work arguably might influence career expectations. On the one hand, the experience of earning and spending one's own money might tend to deflate educational expectations because one does not wish to defer the time when a steady income is available for desired consumption. On the other hand, experience working in the generally low-level jobs in the youth labor market might tend to increase educational and occupational expectations because one does not wish to spend a lifetime in a low-level job. Because of these conflicting possibilities, the direction of effects of working on career expectations are not predicted in advance. Whatever the findings, whether positive, negative, or zero effects, the results are relevant to evaluating policy aimed at encouraging teenagers to work part-time while enrolled in high school--because of the known, strong effects of high school career expectations on career attainments.

Since parental influence on career expectations of youth is so important (Sewell and Hauser 1975; Woelfel and Haller 1972; Curry et al. 1978, 1976; Alexander, Eckland, and Griffin 1975), investigation of the interplay of influences of working and career expectations of youth on each other should include not only measures of youth's career expectations, but also measures of career expectations held by parents for their children. Several studies have found that peer influences on career expectations also are important, and teacher and counselor influences also are studied frequently (Sewell and Hauser 1975; Rehberg and Hotchkiss 1972; Curry et al. 1978, 1976). In the CLD, however, these additional, significant other variables are not nearly as important as parental expectations (Hotchkiss and Chiteji 1981). Hence, the analyses in this paper include parental variables but omit variables describing nonparental significant others.

Two career expectation variables for youth and the corresponding expectations of parents are included--youth's educational expectation for self, youth's occupational expectation for self, parents' educational expectation of the youth, and parents' occupational expectation of the youth. Parental values are averages of reports given by the mother and the father. When only one parent completed the survey, the expectations of that parent are taken as the parental variables. In no case is youth's report of a parent's expectation substituted for missing values. A summary of the measurements is given

in table 1. Because of the strong relationships between parents' and youth's expectation variables, the equations for days absent, days tardy, extracurricular activities, and the two measures of grades were expanded in two steps. First the youth's educational and occupational expectations were added, then the parents' expectations were included with the youth's.[5] Empirical estimates are shown in table 4.

The effects of work variables on the three school outcomes in table 3 are not altered substantially by inclusion of the career expectation variables (compare entries in table 4 to corresponding entries in table 3). In no case does work time exhibit a statistically significant effect on school behavior--days absent, days tardy, extracurricular activities, transcript grade average, and self-reported grades. The conclusion that the CLD contain little evidence of adverse effects of working on these five school behaviors, therefore, is fairly secure at this point.

There are some effects of the career expectation variables that are noteworthy, however. None of the expectation variables affect days absent, reinforcing the hypothesis that physical health is the primary determinant of absence from school. Although educational expectation of the youth apparently has no effect on days tardy, occupational expectation has a nearly significant positive effect. This result is not sensible and may be due to sampling error generated by the extremely high colinearity among the career expectation variables. Of the four career expectation variables, parental educational expectations of youth exert by far the strongest effect on days tardy, and that effect is negative as one might expect.

The most interesting findings in the table are in the equations for extracurricular activities. When parental expectations are absent from the equation, youth's occupational expectations are associated with a significant positive coefficient on extracurricular activities. This observation is due almost entirely to parental occupational expectation, however, because when parental expectations are added to the equation, the coefficient on youth's occupational expectation nearly vanishes and is replaced by a significant positive coefficient on parental occupational expectation. The data thus suggest a case of "spurious correlation," as shown in the following diagram, where the double-headed, curved arrow represents a correlation. This pattern also is manifest in the equation for self-reported grades, but the reduction in the effect of youth's occupational expectation is not as dramatic. Generally, parental expectations exercise more influence on the five school behaviors than do youth's expectations, suggesting that parental pressure stemming from career expectations for their children exercises influence on youth's behavior in school.

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5. Income expectations also were included in some of the statistical calculations but were not significant in any equations; hence, they were dropped from the models.

TABLE 4

EXPANDED EQUATIONS FOR SCHOOL BEHAVIOR--TO INCLUDE CAREER EXPECTATION VARIABLES

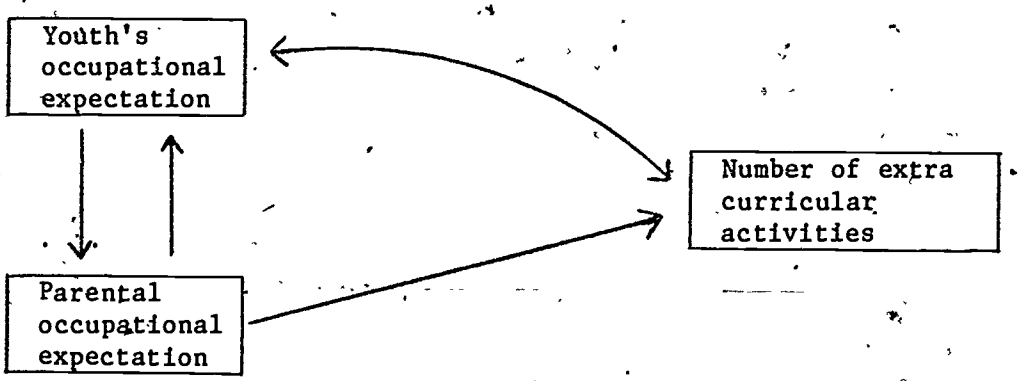
	Dependent Variables (Junior Year)									
	Youth's Expectations					Youth's & Parents' Expectations				
Independent Variables (Soph Year)	Days Absent	Days Tardy	No. of Ex Cur	Trans Grades	Self-Rep Grades	Days Absent	Days Tardy	No. of Ex Cur	Trans Grades	Self-Rep Grades
Intercept	10.6	8.35	-.882*	.430	.604**	15.9	15.2*	-1.44**	.236	.508*
Parental SES	.732	.538	-.0662	-.00936	.00857	.957	.758	-.0910	-.0191	.00109
Fam income	-.158	.0481	.00723	.000669	-.00130	-.174	.0332	.00889	.00140	.000744
N brothers	-.157	-.0650	.0715*	.0303	-.0183	-.167	-.0737	.0720*	.0303	-.0179
N sisters	-.0836	.434	.0138	.0508*	.0371*	-.130	.390	.0196	.0531*	.0387*
Mother in HH	4.18	-.608	-.0996	-.185	-.0719	3.88	-.646	-.0524	-.166	-.0539
Father in HH	3.19	1.42	-.271**	-.0871	-.00910	3.29	1.55	-.280**	-.0905	-.0120
Gender (1=fem)	1.74	-1.79	-.159+	.140*	.0967*	1.79	-2.02	-.179+	.132+	.0861+
Race (1=black)	3.11	2.05	.119	-.363****	-.0140	3.35	2.39	.0939	-.371****	-.0177
Mntl test sc	-.0178	-.155**	.00513	.00141	.00647**	.000970	-.141**	.00266	.000593	.00587**
School assign	-4.37+	-2.38+	-.244*	.0350	.0251	-4.54+	-2.44+	-.216*	.0457	.0361
(Lagged D.V.)	.544****	.289****	.561****	.696****	.456****	.542****	.289****	.550****	.689****	.446****
Hrs at wrk (100s)	.0899	.233	.00149	.00670	.00161	.0800	.237	.00338	.00743	.00251
Ed exp youth	-.101	-.236	.0383	.0254	.00421	.317	.324	-.00450	.0102	-.00186
Occ exp youth	-.0312	.163+	.0165*	.000447	.00976**	.0191	.163+	.00798	-.00293	.00638+
Ed exp par	--	--	--	--	--	-.761	-1.58**	.0518	.0152	-.00879
Occ exp par	--	--	--	--	--	-.0546	.146	.0186*	.00773	.0101*
R-square	.1498****	.2865****	.5030****	.5597****	.4526****	.1518****	.3029****	.5121****	.5627****	.4584****
Adj R-square	.1188	.2536	.4911	.5443	.4393	.1163	.2660	.4987	.5452	.4433

NOTES: Probabilities are for two-tailed tests.

Coefficients are unstandardized OLS regression coefficients.

"Lagged D.V." is the sophomore year (t_1) value of the dependent variable in each equation.

\+ $p \leq .10$
* $p \leq .05$
** $p \leq .01$
*** $p \leq .001$
**** $p \leq .0001$



Empirical estimates of equations to investigate the effects of working on career expectations are reported in table 5. These equations include time-one measures of days absent, days tardy, extracurricular activities, and transcript grades on the right. Parallel calculations using self-reported grades lead to similar results.

The primary observations in these estimates are in line with past research. The R-squares for each of the four career expectation variables are unusually high for individual-level data, and the high R-squares are not due entirely to the stability of career expectations over time.[6] Further, the strong influence of parental expectations on youth's expectations is clear. Interestingly, youth's expectations exert almost as strong an influence on parents as parents exert on youth. These findings are thoroughly discussed by Hotchkiss and Chiteji (1981) in the framework of a differential equation model.

For the present paper, interest focuses on the effects of working on career expectations. In no equation do hours at work reach statistical significance. Except for youth's educational expectations, the probability levels associated with hours are quite high ($p \geq .5$). The calculated probability for the coefficient of hours in the youth's educational expectation equation is .1343, so a larger sample might reveal a small positive effect of work time on youth's educational expectations. On balance, however, the evidence against effects of working on career expectations of youth and of parents for their children is fairly strong in these data. Alternative specifications of each equation (estimates not tabulated) were tried. These specifications exclude all the career expectation variables except the lagged dependent variable in each equation. The rationale behind these alternative specifications is that hours may affect one type of career expectation indirectly by influencing other career expectations. Again, none of the coefficients on hours are statistically significant.

Assignment to a school outside one's home school area tends to have deflationary effects on career expectations of youth and of parents for their children. The effects are not large, however, and only one is statistically significant at the traditional .05 cutoff. It is apparent from these data

6. Even without the lagged value of the dependent variables in each equation, R-squares well above .50 could be anticipated, as the bivariate correlations over a one-year interval among all four expectation variables are extremely high.

TABLE 5

EFFECTS OF WORK ON CAREER EXPECTATIONS

Independent Variables (Soph Year)	Dependent Variables (Junior Year) Youth's Ed Exp	Youth's Occ Exp	Parents' Ed Exp	Parents' Occ Exp
Intercept	2.82****	4.28^{+}	2.58****	5.87**
Parental SES	.0662	.362	-.0709	.206
Fam Income	.000159	.0120	.0157^{+}	-.0130
N brothers	.0103	-.00805	.00177	-.151
N sisters	.0436	.0145	.00645	.0431
Mother in HH	.0173	-.755	-.0191	-.572
Father in HH	.0132	.253	-.0788	-.614
Gender (1=fem)	.0481	.764^{+}	-.0484	.0812
Race (1=black)	.414***	2.01****	.224*	.697
Mntl test sc	.00814*	.0664***	.00176	.0107
School assignment	-.199*	-.570	-.146^{+}	-.339
Hrs at wrk (100s)	.0163	.0310	.000616	.0155
Days absent	.000734	.0234	.000347	-.0136
Days tardy	.00248	-.00317	-.00173	-.0143
Extra curr act	.0333	-.0735	.0226	.180
Grades--trans	.216***	.386	.0966^{+}	.695**
Youth's ed exp	.457****	.384*	.170****	-.0318
Youth's occ exp	.0201**	.505****	.00247	.0789**
Par ed exp of yth	.131**	.0375	.483****	.716****
Par occ exp of yth	.0201*	.148****	.0394****	.584****
R-square	.6856****	.6921****	.7152***	.7283****
Adj R-square	.6753	.6820	.7058	.7193

NOTES: Probabilities are for two-tailed tests.

Coefficients are unstandardized OLS regression coefficients.

$^{+}$ $p \leq .10$
* $p \leq .05$
** $p \leq .01$
*** $p \leq .001$
**** $p \leq .0001$

that any career expectation effects of school assignment to achieve school desegregation are not large enough to be of serious concern. However, more thorough examination of these effects within race and gender subsamples would be useful.

SUMMARY AND DISCUSSION

This paper investigates the effects of part-time work during high school on school-related behaviors and on career expectations. Five dependent variables are classified as school-related behaviors--days tardy during the school year, days absent during the school year, number of extracurricular activities, transcript grade average, and self-reported grades. Four career expectation variables also are included--youth's educational expectations for themselves, youth's occupational expectations for themself, parental educational expectations for youth, and parental occupational expectations for youth.

The initial analysis examines the relationship between hours of work and the five school-related behaviors. Drawing on the work of Greenberger and her associates, who find a possible curvilinear relationship between school grades and hours of work, hours, and the square of hours both are included in the equations for the four school-related activities. The data indicate that neither a linear nor a nonlinear effect of hours of work occurs for any of the school-related variables--days absent, days tardy, number of extracurricular activities, and the two measures of grades. This result tends to refute the contention that hours spent on the job interferes with schooling.

Additional analyses were conducted to determine if the quality of work, as indicated by job status, enters into the effect of work time on school-related activities. It is postulated that the quality of work interacts with hours spent on the job to produce effects on school activities. Empirical investigation of interaction effects reveals scant evidence that job status and hours at work interact to produce effects on school behavior. Because of the conceptual difficulty of defining job status when one is not working, four different estimation strategies for determining interaction effects are used--although tabulations are presented for only one of the strategies. Three of the four strategies turn up no significant coefficients of the product of hours and status. Significant coefficients are observed when a pairwise missing-data correlation matrix is input into the regression calculations. The difficulty in justifying this procedure theoretically (about two-thirds of those in the sample were not working during their sophomore year), combined with the fact that the signs of the significant coefficients are the opposite of the a priori hypotheses, discounts these findings, however.

Inclusion of career expectations of youth for themselves and of parents for their children in the five equations for school behaviors does not alter the conclusion that work has very little impact on the five school behaviors. Further, investigation of possible effects of working on the career expectation variables reveals no statistically significant results. The career expectation variables do affect the school behaviors, however, and the signs of the significant coefficients generally are sensible.

It is clear that the data analyzed in this paper do not support the hypothesis that work interferes with schooling. Linear specifications of the effect of hours at work on days absent from school, days tardy from school, number of extracurricular activities, transcript grades, and self-reported grades reveal no significant coefficients. Nonlinear specifications of the effects of hours on these dependent variables reveal no significant effects. Specification of interaction effects between job status and hours at work turn up little evidence of effects of working. Addition of career expectations to the equations for the five school behaviors does not alter these conclusions. Further, estimates of effects of work time on career expectations indicate no significant effects of working. In most cases the probability levels associated with effect estimates are so high that there is little ambiguity regarding the conclusion that effects are near zero.

The analyses reported here, therefore, do not reveal any reason to be hesitant about policy designed to encourage part-time work of secondary school students. That is not to say that no reasons exist for hesitation. Greenberger's conclusions regarding effects of working on consumption of alcohol and marijuana and attitude development are not addressed in the present study. Moreover, the results presented in this paper certainly cannot be taken as definitive evidence against the hypothesis that work interferes with schooling. First, only five school outcome variables have been studied. Second, the sample size of the CLD is not large enough to pick up small effects. Third, the sample is a local sample. Fourth, the analysis applies to sophomores and juniors only, not to seniors. Finally, the analysis is not based on a carefully thought-out model of the process of change over time. This last point characterizes other work on the effects of part-time employment on schooling and most of social science research more generally. A useful approach would be to develop a utility model of optimum time allocation, postulate that each person's equilibrium is determined by the optimum, and then specify a model of change that shows each individual tending to move toward the equilibrium. The equilibrium itself is likely to be a function of variables that change over time, so that a simultaneous model of change over time probably is necessary. A single-equation model might, however, be a useful starting point.

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